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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/820,114

04/08/2004

Yoshihiko Imanaka

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12/11/2008

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EXAMINER

DANG, TRUNG Q

ART UNIT

PAPER NUMBER

2892

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DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/820,114	<b>Applicant(s)</b> IMANAKA ET AL.	
	<b>Examiner</b> Trung Dang	<b>Art Unit</b> 2892	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 September 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 13, 14, 16-19, 47-49 and 52-54 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 13, 14, 16-19, 47-49, 52 and 54 is/are allowed.
- 6) ☒ Claim(s) 53 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>6/5/08; 10/22/08</u>  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 53 is rejected under 35 U.S.C. 103(a) as being unpatentable over Renn (US 2003/0048314) in view of Hatono (US 7,175,921) and McMillan et al. (US 5,759,923), all of record.

The rejection is maintained as of record and repeated herein.

Renn teaches a method of fabrication active and passive components on a circuit substrate (para. [0108]), which includes deposition of conductors, resistors, dielectrics (para.[0097]), inductor (Fig. 13 and related text), capacitor (para. [0108]), interconnects (para. [0139]), said method comprising a film forming step, said film forming step forming at least on of said dielectric film, said resistor film and said conductor film film by ejecting dry aerosol of fine solid particle material with a carrier gas (para. [0130]). Note that, as disclosed in para. [0130], the droplets are dried by the sheath gas, resulting in dried particles deposited on the substrate, hence the disclosed aerosol is a **dry** aerosol as claimed. For the claimed limitation regarding the carrier gas, see para. [0055].

Renn differs from the claims in not disclosing that the dry aerosol is ejected into reduced pressure environment with a speed of 200-400 m/second even though Renn

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teaches particle velocities of about 100 m/second, and that greater speeds should be possible (bottom of para. [0131]).

In the same field of endeavor, Hatono teaches an aerosol deposition process in which a substrate is bombarded with a particle beam with a velocity within a range from 50-450 m/second (col. 10, lines 10-17), and the particle beam is ejected into a reduced pressure environment inside the deposition chamber (Fig. 1, and col. 12, lines 45-47). Note that the pressure inside the aerosol generator 103 is higher than the reduced pressure in the deposition chamber 106 because nitrogen carrier is introduced into the aerosol generator 103 (col. 12, lines 25-27) to effectuate an ejection of particle beam from a high pressure environment to a low pressure environment.

It would have been obvious to one of ordinary skill in the art to perform the dry aerosol deposition process of Renn using particle speed and reduced pressure taught by Hatono because using known process parameters of related technique for depositing a film would have been within technical grasp of one skilled in the art so as to achieve predictable results of forming a high quality film (see Hatono, col. 10, lines 27-34).

Also noted that Renn's process is an impact activation process because the films are deposited by impaction of particles on the substrate.

The combined process of Renn and Hatono teaches a dry aerosol process for making conductors, resistors, dielectrics, inductor, capacitor, interconnects an inductor as described above. The combination differs from the claim in not disclosing the step of making such elements using a resist pattern as a mask.

McMillan teaches an integrated circuit in which a pattern of capacitor dielectric layer 82 is formed by aerosol deposition (Fig. 8 and col. 14, lines 30-32). Although McMillan does not show the use of a resist pattern as a mask in making the pattern dielectric layer 82, such application of a resist mask so as after blanket aerosol deposition of dielectric material 82, the resist mask is removed to leave a desired pattern for layer 82 (a technique known in the art as lift-off) would have been within the common knowledge of one of ordinary skill in the art.

***Allowable Subject Matter***

2. Claims 13-14, 16-19, 47-49, 52, 54 are allowed.

3. The following is an examiner's statement of reasons for allowance:

Independent claims 13, 47, 52, and 54 are allowed over prior art of record because the prior art fails to teach or suggest the claimed step of generating the dry aerosol of the fine solid particle material including a heating a powder of said fine solid particle.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Response to Arguments***

4. Applicant's arguments filed 9/30/2008 have been fully considered but they are not persuasive.

In page 9 of the Remarks, applicants argue that "there is no basis in any of the cited references, nor elsewhere within the art at the time of the present invention, which provides for the AD process as set forth in Hatono et al. including the use of a resist process. A person skilled in the art would not have any reason to use a resist process in the AD process of Hatano as in the present invention, because of the different phenomenon ("impact activation") occurring at the time of the film deposition....In short, the technology of AD process belongs to a different technical field distinct from the technical field of CVD or sputtering, in which conventional lift-off processes have been used successfully".

The argument is found unconvincing because, as admitted by applicants, conventional lift-off processes have been widely used in the field of CVD or sputtering, hence one skilled in the art would reasonably expect the use of lift-off processes in the technology of AD to yield predictable results in forming a patterned layer. The use of a patterned photoresist layer as a mask in the lift-off process merely provides a pattern from which a layer will be formed. Even if the phenomenon "impact activation" of the AD process may penetrate through the resist mask, one skilled in the art would find it obvious to simply making the resist mask thick enough so as to avoid the effect of "impact activation".

***Conclusion***

5. This is a RCE of applicant's earlier Application No. 10/820,114. All claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no, however, event will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Trung Dang whose telephone number is 571-272-1857. The examiner can normally be reached on Mon-Friday 9:30am-6:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thao Le can be reached on 571-272-1708. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Trung Dang/  
Primary Examiner, Art Unit 2892

12/8/08